

WHAT IS CLAIMED IS:

1 1. A multi-mode scheduler including a $N \times kM$ scheduler for
2 adjusting data transmission between N -pieces of input interface
3 sections, where said N is a positive integer, and said kM -pieces
4 of output interface sections, where said M is a positive integer
5 and said k is an integer not less than two, said multi-mode
6 scheduler comprising:

7 k -pieces of $N \times M$ schedulers to be said $N \times kM$ scheduler; and
8 $(k-1)$ -pieces of selection circuits for switching allocated
9 output port information input from an outside of said $N \times kM$
10 scheduler and information from said $N \times M$ scheduler at a front step
11 so as to be input to said $N \times M$ scheduler as allocated output port
12 information:

13 wherein an operation of said $N \times kM$ scheduler or an operation
14 of said $N \times M$ scheduler having k -pieces of priority classes is set
15 freely with switching operation of said $(k-1)$ -pieces of selection
16 circuits.

1 2. The multi-mode scheduler according to Claim 1, wherein
2 j -pieces of said $N \times kM$ scheduler (where j is an integer not less
3 than two) are connected so as to make up said $jN \times kM$ scheduler when
4 said allocated output port information input from said outside
5 is used.

1 3. The multi-mode scheduler according to Claim 2, wherein
2 each of said $(k-1)$ -pieces of selection circuits selects said
3 allocated output port information input from said outside when
4 said allocated output port information input from said outside
5 is used.

1 4. The multi-mode scheduler according to Claim 2, wherein
2 j-pieces of said $N \times kM$ scheduler are pipeline-connected so as to
3 make up said $jN \times kM$ scheduler (where j is an integer not less than
4 two).

1 5. The multi-mode scheduler according to Claim 1, wherein
2 said $N \times kM$ scheduler is used alone so as to make up said $N \times M$
3 scheduler having k-pieces of priority classes when information
4 from said $N \times M$ scheduler at said front step is used.

1 6. The multi-mode scheduler according to Claim 5, wherein
2 each of said (k-1)-pieces of selection circuits selects
3 information from said $N \times M$ scheduler at said front step when said
4 $N \times kM$ scheduler is used alone.

1 7. The multi-mode scheduler according to Claim 1, wherein
2 each of said N-pieces of input interface sections includes a
3 virtual output queue) buffer for storing reception data for each
4 output interface section to be a destination.

1 8. A multi-mode scheduler including a $N \times kM$ scheduler for
2 adjusting data transmission between N-pieces of input interface
3 means, where said N is a positive integer, and said kM -pieces of
4 output interface means, where said M is a positive integer and
5 said k is an integer not less than two, said multi-mode scheduler
6 comprising:

7 k-pieces of $N \times M$ schedulers to be said $N \times kM$ scheduler; and
8 (k-1)-pieces of selection means for switching allocated
9 output port information input from an outside of said $N \times kM$
10 scheduler and information from said $N \times M$ scheduler at a front step

11 so as to be input to said $N \times M$ scheduler as allocated output port
12 information:

13 wherein an operation of said $N \times kM$ scheduler or an operation
14 of said $N \times M$ scheduler having k -pieces of priority classes is set
15 freely with switching operation of said $(k-1)$ -pieces of selection
16 means.

1 9. The multi-mode scheduler according to Claim 8, wherein
2 j -pieces of said $N \times kM$ scheduler (where j is an integer not less
3 than two) are connected so as to make up said $jN \times kM$ scheduler when
4 said allocated output port information input from said outside
5 is used.

1 10. The multi-mode scheduler according to Claim 9, wherein
2 each of said $(k-1)$ -pieces of selection means selects said
3 allocated output port information input from said outside when
4 said allocated output port information input from said outside
5 is used.

1 11. The multi-mode scheduler according to Claim 9,
2 wherein j -pieces of said $N \times kM$ scheduler are pipeline-connected
3 so as to make up said $jN \times kM$ scheduler (where j is an integer not
4 less than two).

1 12. The multi-mode scheduler according to Claim 8, wherein
2 said $N \times kM$ scheduler is used alone so as to make up said $N \times M$
3 scheduler having k -pieces of priority classes when information
4 from said $N \times M$ scheduler at said front step is used.

1 13. The multi-mode scheduler according to Claim 12,

2 wherein each of said (k-1)-pieces of selection means selects
 3 information from said N×M scheduler at said front step when said
 4 N×kM scheduler is used alone.

1 14. The multi-mode scheduler according to Claim 8, wherein
 2 each of said N-pieces of input interface means includes a virtual
 3 output queue) buffer for storing reception data for each output
 4 interface means to be a destination.

1 15. An apparatus including a multi-mode scheduler
 2 including a N×kM scheduler for adjusting data transmission
 3 between N-pieces of input interface sections, where N is a
 4 positive integer, and kM-pieces of output interface sections,
 5 where M is a positive integer and k is an integer not less than
 6 two, said multi-mode scheduler comprising:

7 k-pieces of N×M schedulers to be said N×kM scheduler; and
 8 (k-1)-pieces of selection circuits for switching allocated
 9 output port information input from an outside of said N×kM
 10 scheduler and information from said N×M scheduler at a front step
 11 so as to be input to said N×M scheduler as allocated output port
 12 information:

13 wherein an operation of said N×kM scheduler or an operation
 14 of said N×M scheduler having k-pieces of priority classes is set
 15 freely with switching operation of said (k-1)-pieces of selection
 16 circuits.

1 16. An apparatus including a multi-mode scheduler
 2 including a N×kM scheduler for adjusting data transmission
 3 between N-pieces of input interface means, where N is a positive
 4 integer, and kM-pieces of output interface means, where M is a

5 positive integer and k is an integer not less than two, said
6 multi-mode scheduler comprising:

7 k -pieces of $N \times M$ schedulers to be said $N \times kM$ scheduler; and
8 $(k-1)$ -pieces of selection means for switching allocated
9 output port information input from an outside of said $N \times kM$
10 scheduler and information from said $N \times M$ scheduler at a front step
11 so as to be input to said $N \times M$ scheduler as allocated output port
12 information:

13 wherein an operation of said $N \times kM$ scheduler or an operation
14 of said $N \times M$ scheduler having k -pieces of priority classes is set
15 freely with switching operation of said $(k-1)$ -pieces of selection
16 means.

1 17. A multi-mode scheduling method used in a $N \times kM$ scheduler
2 for adjusting data transmission between N -pieces of input
3 interface means, where N is a positive integer, and kM -pieces of
4 output interface means, where M is a positive integer and k is
5 an integer not less than two, said multi-mode scheduler
6 comprising:

7 k -pieces of $N \times M$ schedulers to be said $N \times kM$ scheduler; and
8 $(k-1)$ -pieces of selection circuits for switching allocated
9 output port information input from an outside of said $N \times kM$
10 scheduler and information from said $N \times M$ scheduler at a front step
11 so as to be input to said $N \times M$ scheduler as allocated output port
12 information:

13 wherein an operation of said $N \times kM$ scheduler or an operation
14 of said $N \times M$ scheduler having k -pieces of priority classes is set
15 freely with switching operation of said $(k-1)$ -pieces of selection
16 circuits.